XERPT

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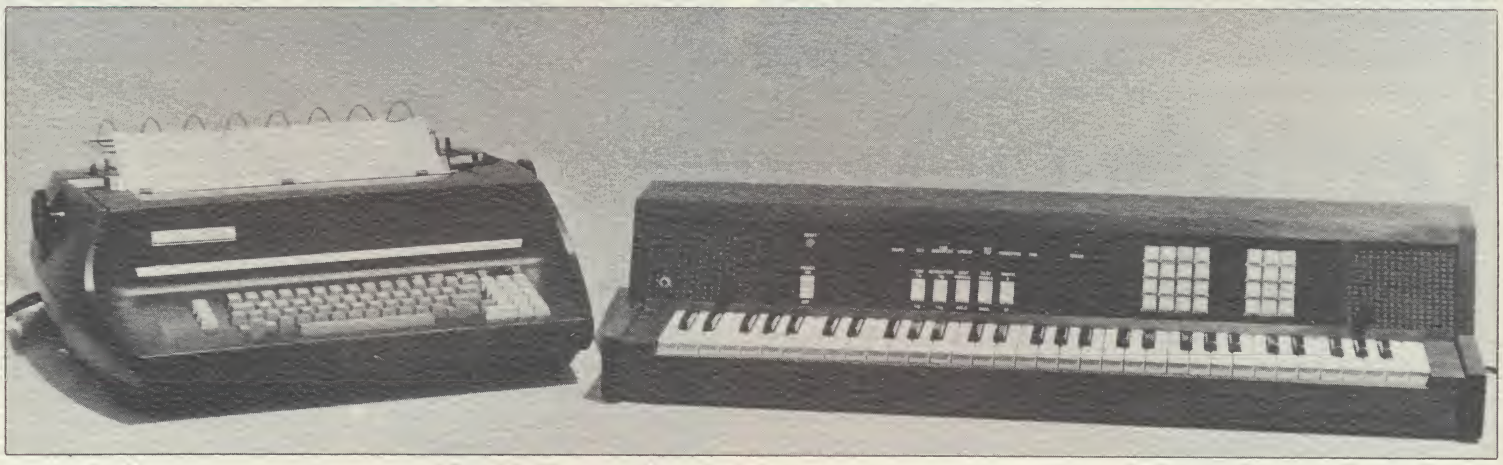


'Notemaker, Notemaker Make Me A Note'

Not only are they playing your song these days, they're storing, transposing, editing, printing and playing it back on a microcomputer-driven musical production system now taking its measure of the musical market.

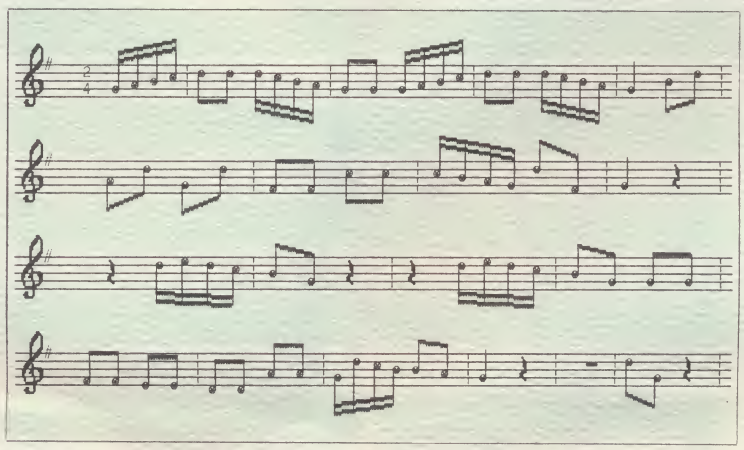
So let's hear it for the Notemaker™, a computerized offspring of the old music box which is instrumental in every phase of music composition and arranging. A song played on its keyboard is stored in the microcomputer's memory and, presto, played back in an organ-like tone in any tempo or, presto-presto, printed on ordinary computer print-out complete with proportionately spaced notes (including rests, ties, beams, ledger lines and accidentals in treble and bass clef).

Credit the Notemaker's virtuoso performance to an 8-bit Zilog Z80 mircrocomputer, a Xerox 1750 impact printer and some jazzy software written for an erasable PROM. The whole number was orchestrated by William J. Ooms, an electronics engineer and consultant out of Homewood, Illinois, who vamped the idea for the past year and a half between consulting jobs.

The Notemaker transposes a full seven octave range in any key (up to six sharps and flats) in a fraction of a second. Additionally, it changes, inserts, deletes or appends over 750 notes, with 16,000 more available in optional memory.

Composers, musicians and arrangers, who presently spend hours handwriting their scores, can listen to and see their compositions within seconds or minutes, depending on the complexity of the music. The score is printed on ordinary computer print-out, eight staffs to the first page, ten staffs thereafter, doing away with the need for composition paper.

Although the musical printer does not deliver 100 percent of what musicians encounter — for example it plays back a single melodic line without chords — it is expected to supply people in the professional music industry a little time on their hands.



The Notemaker makes music on ordinary computer print-out.

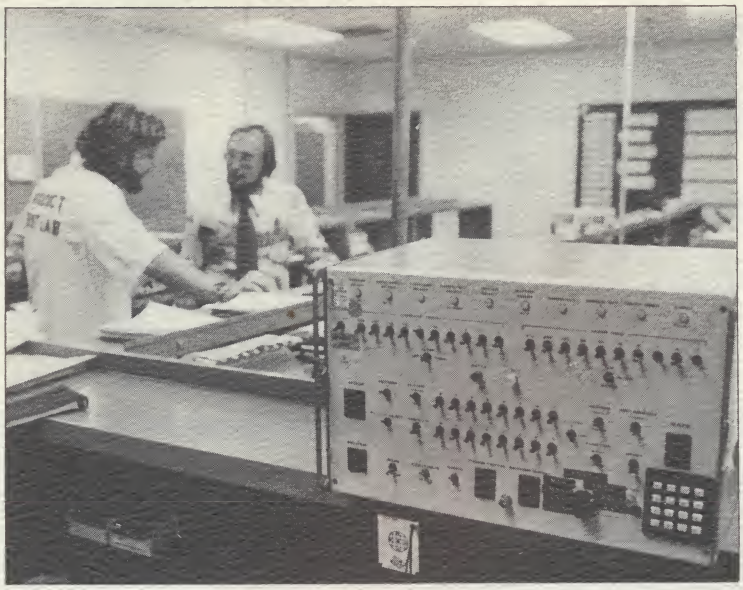
Ordinarily, to finish off a fortissimo, a composer scribbles it by hand, sends it off to a copyist, then to a publisher for printing on an aluminum plate.

Those three stages are bypassed by the Notemaker, which prints out virtually instantaneous variations on a theme, transposing from one key to another as the imagination demands. A built-in metronome runs continuously, permitting adjustable tempos and rests. The Xerox 1750 allows proportional spacing and places neat looking lyrics under appropriate staffs.

Is the Notemaker a prelude to a one man band microcomputer capable of composing as well as playing and printing its own song?

Probably not, says Ooms, who does look for separate future options offering tenor and alto clefs as well as, someday, chords.

Still, somewhere over the rainbow, don't be surprised if 'Music, Microcomputer, Please' replaces 'Music Maestro, Please' on the charts. □



B and C testing is done at Xerox Diablo's Product Test Lab.

Al Kamp tracks Quality Assurance Department's test procedures.

Certifying a Vendor's Product

You don't read much in the trades about dock merging — certifying a vendor's product at the source, obviating further inspection and testing.

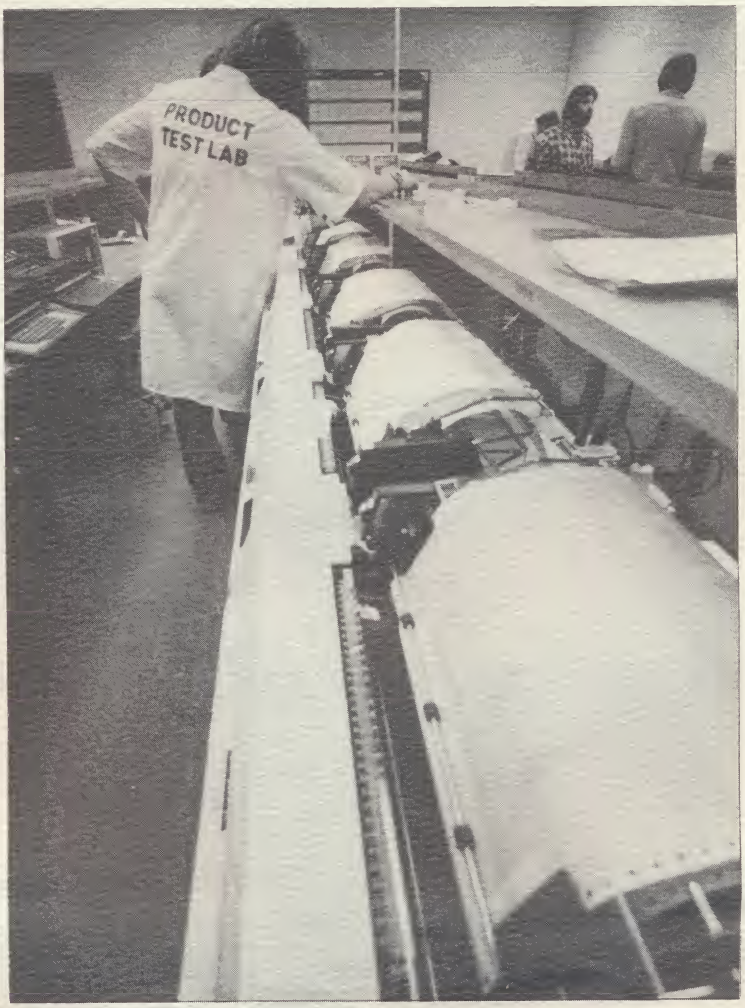
You don't read much about it because dock merging happens infrequently in the computer industry and rarely gets bandied about by either OEM or vendor. For a vendor — any vendor — getting its product source certified by a major customer is the ultimate form of OEM flattery, a quietly prestigious statement about the product's quality and reliability.

"It's no small accomplishment," says Al Kamp, manager of Quality Assurance for terminals and printers at Diablo Systems, Inc., a Xerox subsidiary located in Hayward, California, and a recent recipient of a major OEM's decision to dock merge Diablo terminals and printers. "To become a certified vendor means not only that acceptable quality levels are maintained throughout the manufacturing process but that product reliability exceeds the specified goal of over 2,000 hours Mean-Time-Between-Failure (MTBF)."

Diablo HyType II printers actually have experienced MTBF performance of 2,800 hours at a 90 percent confidence level. "To know that we're operating roughly in the 2,800 hour range at 90 percent confidence is damn good performance," says Al, a 22-year veteran of quality and reliability engineering. "I don't know of anyone else's product doing better."

Some companies pay lip service to quality, of course, but Diablo devotes substantial resources to a comprehensive operational commitment to quality products. In essence such a commitment means both the know-how to comply with the more progressive statistical evaluations of quality assurance and the implementation of those evaluations in a professional and disciplined mode.

"Quality is basically a very simple operation," says Al, a stocky, crew-cut, straightforward man with a cracker-barrel wit and a quick mind. "You have the responsibility of getting quality materials in the door, of protecting your product line from supplier error, then you have the responsibility of assuring the quality of the product out the door. Sandwiched between is the product quality assurance design activity needed to bring new products and components to the marketplace.



Al makes it sound deceptively simple, but just how do people engaged in the business of 'quality' go about assuring these controls? For that matter, what's the difference between quality assurance and quality control?

"Here, quality assurance refers to actions taken to assure production controls to achieve a quality product; quality control, on the other hand, is the totality of techniques used to execute those actions. One of our groups under Quality Assurance is Advanced Quality Engineering, the 'up front' thinkers who plan how to bring aboard and maintain the product in a go mode.

"You don't inspect or test quality into your product. You've got to assure it, first through the design phase, then through qualification testing and subsequent process and tool certification. We exercise rigorous controls to maintain those activities. In essence, the quality engineering people define the scope of what and how to control, and the quality control people provide the labor for executing, inspecting and controlling the tasks defined for them."

The quality assurance process begins with the advanced quality engineering group, which performs

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THE NOT-SO-REMOTE PRINTER SALESMAN

Fritz Riedlin: Our RTS Man in Washington

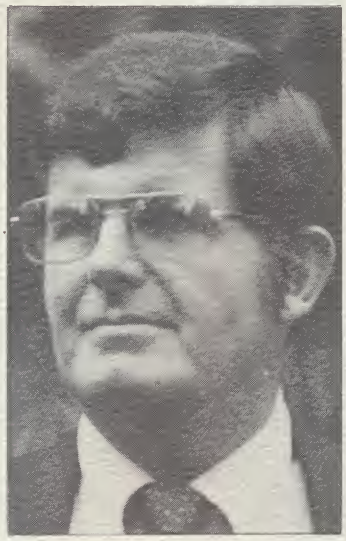
The voice crackled over the squawk box — resonant, casually confident, lacking any giveaway regional twang.

'Six foot and slightly overweight,'' it said, responding to a request for a physical self-description. ''I put down 'hazel' on a California driver's license application once, but they're actually kind of a brownish color.''

Fritz Riedlin, regional terminal specialist (RTS) for the mid-Atlantic region, born and raised in Southern California, schooled at Princeton (B.S.E.E.), was talking from his Washington, D.C. office.

''I came into Xerox via a series of mergers and acquisitions. The progression was from a small electronics firm in Southern California (Consolidated Systems Corporation) which later became a small struggling computer company, to a rather successful and dynamic computer company (Scientific Data Systems) acquired by Xerox in May 1969.''

Prior to SDS, where he had first specialized in the geophysical market, acting as product manager on a portable seismic data acquisition system, then managing computer installations for major accounts, Fritz had worked as a systems engineer and an engineering representative.



Fritz Riedlin

With a three-month old Xerox badge, he and his family — wife Ann, sons Eric and Carl, daughter Chrissy — shipped off to Honolulu, establishing a company beachhead on the Pacific salient of the military market while the family stormed ashore just beyond Diamond Head. It was a successful landing on both Hawaiian fronts, and the Riedlins had a tough time leaving two years later. But Fritz responded to the company call like a true sailor, which he once was (sort of, 'naval officer' better befitting his stripe and a half) and flew eastward to the nation's capital, where he's been stationed ever since.

As part of his first Washington assignment, Fritz helped pioneer an interdivisional marketing team concept which found him responsible for marketing the whole range of Xerox products to one account nationally — the U.S. Postal Service.

In June of 1973 Xerox announced the 1200, a fresh corporate number which launched some company careers and, in Fritz's case, resulted in a quota achievement of 119%. Thereafter, he planned and coordinated sales efforts that culminated in the installation of three real-time control systems, attracting enough attention to be named the mid-Atlantic RTS last December.

'How does he see his RTS role?' asked XERPT's interviewer in El Segundo, amid a snap of static.

''In two flavors: doing the necessary promotional and and technical support work to achieve our quotas, but not being totally specialized. I like to assist in other areas, on the 9700 for example, standing in for a manager on leave, things like that.''

Fritz's reflections on the state-of-the-art stem, naturally enough, from his special background dealing with the geophysical and scientific communities. ''Back in my CSC and SDS days we saw tremendous innovations in computer power and speeds which created more algorithms and greater capacities for problem solving. We wound up with more marks on the page so the scientist could read what he did. As long as the scientist could read the marks, fine.

''In the seismic area, we went a little further, adding technology which helped the scientist try to figure out on a piece of paper whether it was worth drilling for oil in a particular area. Nowadays we're concerned about the quality, appearance and format of what is being put on paper. We're beginning to see the merging of printing and data processing technology. And that's exactly where the Xerox fit is.''

Are Rockville, Maryland, where he lives, and Chesapeake Bay, where he sails, more than mere miles from South Pasadena, where he was born, and Balboa Island, where he once sailed?

''Actually, our life style is about the same here as it was in Southern California,'' he says. ''We sailed year 'round in L.A., of course, but here we stop about the end of November. The Chesapeake is absolutely delightful sailing. Now if we could just get Congress to legislate away August and February . . .'' □

Certifying

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design reviews on new programs, structures the inspection procedures, and defines and assists Manufacturing Engineering and Test Equipment Engineering to control the product in production.

Each new product is assigned a series of planning and development goals which are followed through three phases of qualification activity: prototype, pre-production start-up and production. In turn, these goals are monitored and tested throughout each phase by another arm of the Quality Assurance department, the Reliability Assurance Group, which conducts what is called ''A,'' ''B'' and ''C'' testing.

Actually, ABC testing is a misnomer, a conveniently simple phrase disguising a protracted and repetitive series of rigorous reviews and tests designed to force continuing reevaluation of the product concept and design through production hard tooling release.

''Our philosophy is 'make it fail','' Al stresses, explaining B phase of the process. ''What are the margins? If the specification says it should operate at room ambient temperature plus 45°F to 105°F, what happens at temperatures in excess of these limits? Does the failure rate significantly increase?

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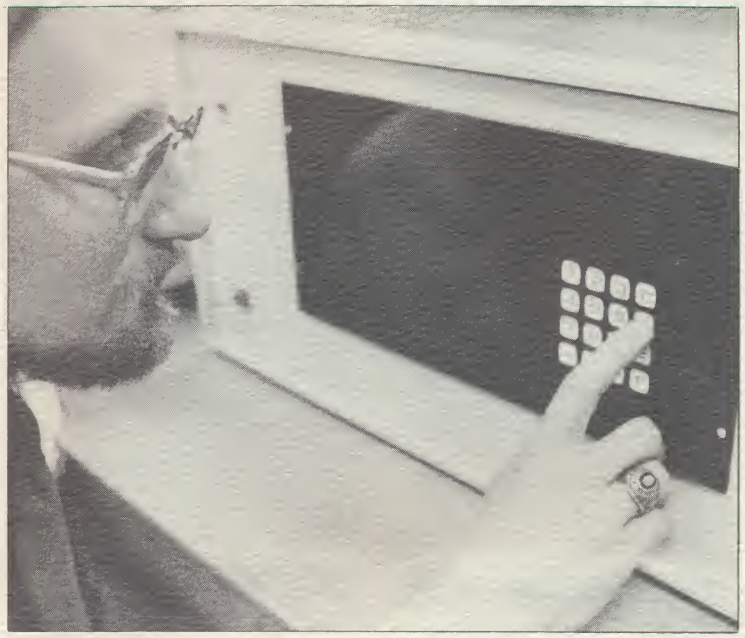

Bob Welsh, punching tester, manages Reliability Assurance Dept.

OFF-LINE

And The Winner Is . . .

The Acronym Game Contest (TAGC) results are in. Although we promised three acronymologist winners, four turned up, there being a tie in category 2.

Winner of the "greatest number of original acronyms" (category 1) was S. K. O'Halloran, DP/Sys Procedures, Concord, CA, who submitted the following entries: MIRV feature (Mistake Insurance Repeating Variable); CATCH 22 (Computer Application To Confuse Humanists); XEROX program (Xerox Employees Reduction Of Unknowns (X); DUMB report (Daily Utilization of Monthly Billing); END bomb (Extended Nuclear Detonation); and PRINT emergency (Procedures Requiring Individual Training).

Category 2, "the most outrageous single acronym in the real world," produced a choice between NAVTACDOCDEVPRODACT, submitted by Thomas S. Ahern, Systems Results, San Francisco, and PEJAMA, offered by Robert C. Loyd, Philips Petroleum Co., Bartlesville, OKLA. *Two* good to be true, so we awarded a tie. Not so incidentally, the former acronym stands for Naval Tactical Doctrine Development and Production Activity and the latter for Plasma Emission Jarrell-Ash Monochromater Adaption.

JOVIAL was the winner of category 3, "the most original acronym not necessarily in the real world" (but this one happens to be), sent in by J. Czechowski, General Electric Company, Schenectady, NY. JOVIAL actually was born OVIAL, according to a book on the history and fundamentals of programming languages, and referred to a draft proposal for an Air Force programming language entitled *O*ur *V*ersion of the *I*nternational *A*lgebraic *L*anguage. When the brass rejected OVIAL as unsatisfactory, JOVIAL was chosen, acknowledging the author of the original draft proposal, Jules Schwartz, and changing the acronym's meaning to *Jules' Own Version of the International Algebraic Language.*

Congratulations, TAGC winners, your Cross Pen & Pencil sets are in the mail (somewhere).

XTEN Update

Readers of our premiere issue will recall XERPT's story about XTEN, the proposed Xerox Telecommunications Network that would provide a nationwide digital communications network for some 200 major U.S. metropolitan areas. Last November 18, as we reported, Xerox filed a petition with the Federal Communications Commission requesting that a band width of the very high end of the radio spectrum be set aside as a common carrier for electronic message services. Acting on the petition last July, the FCC gave tentative approval to a staff report which recommended setting aside the microwave radio frequencies. The Commission asked for comments about the Xerox proposal and said, after the comment period ends November 30, it hopes to formulate rules for the end-to-end digital services on the 10-GHz band without the need for further proceedings.

At an assembly line for printer terminals at Xerox Diablo, many machines are pulled off the line at random and given an extensive pre-package audit. Some are also randomly selected for a post-package audit — literally pulled off a truck, unpacked and subjected to another complete test of every machine function.

Certifying a Vendor's Product

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What is the safety margin? We go through a complete specification compliance, assessing all the margins. As smart as you think you are, you'll find some customer who'll use your equipment in a way you didn't think about. That's why we test to make it fail. Not that the design engineer hasn't done the same thing, but B-test is a completely independent appraisal."

The A test certification performed by design engineers begins the process of pinpointing the entire range of product specification compliances. Here, the design engineer proves the product's feasibility. This is followed in the B and C phases with questions directed at manufacturability and maintainability, at subassembly run-in and component selection — the gamut of design and pre-production decisions that contributes to customer satisfaction, ease of production and overall success of the product line.

The B phase of Quality Assurance surveillance guarantees another pass at design verification. Essentially, B test is a repetition of A test performed on a pre-production model of the product. Al drives home the point quaintly: "You wouldn't send Dillinger to check the bank. Now that's not meant derogatorily against design engineers, but it's human nature to overlook your own faults. We're trying to take an independent look at what the customer will do and see. It's a different type of mentality from design engineering; it takes a different talent. We're nit pickers, bean counters, scratchers."

Next, the idea is to get into a production mode, to begin the pre-production hard tooling, putting the tooling and gauging processes on line, getting vendors in order, training inspectors and manufacturing personnel, verifying these activities, then producing the C-test units, whose destiny is to undergo the same nit picking scrutiny as B test hardware.

"In essence," adds Al, "you're certifying that this hard tooled product will not experience any degradation during the manufacturing start-up cycle. You're not only maintaining the integrity of the product, you're improving it. Now you're ready to put yourself on normal manufacturing and product reliability growth curves."

So ends the 'up front' work.

Thereafter, the quality assurance process drops into a quality control manufacturing mode during which all of the now documented inspection and control procedures necessary to build the product are correctly executed on line.

Theoretically, of course, it is possible to build a product that will last virtually forever. Obviously, however, production specifications must be based on the reality of what the marketplace demands. "Our goal is to meet those demands and the corresponding cost trade-offs and still maintain both a competitive price environment as well as quality and reliability."

A manufacturing organization is a "continual struggle organization" that must stay up with technological changes, with problems inherited from vendors, with changes in materials, processes and people. "One of the games you want to play in the quality business is to keep your problems as far backstream as possible. The further you keep problems from the back door, the greater the probability of preventing trouble for your customer. Our job is the customer." □

XERPT

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